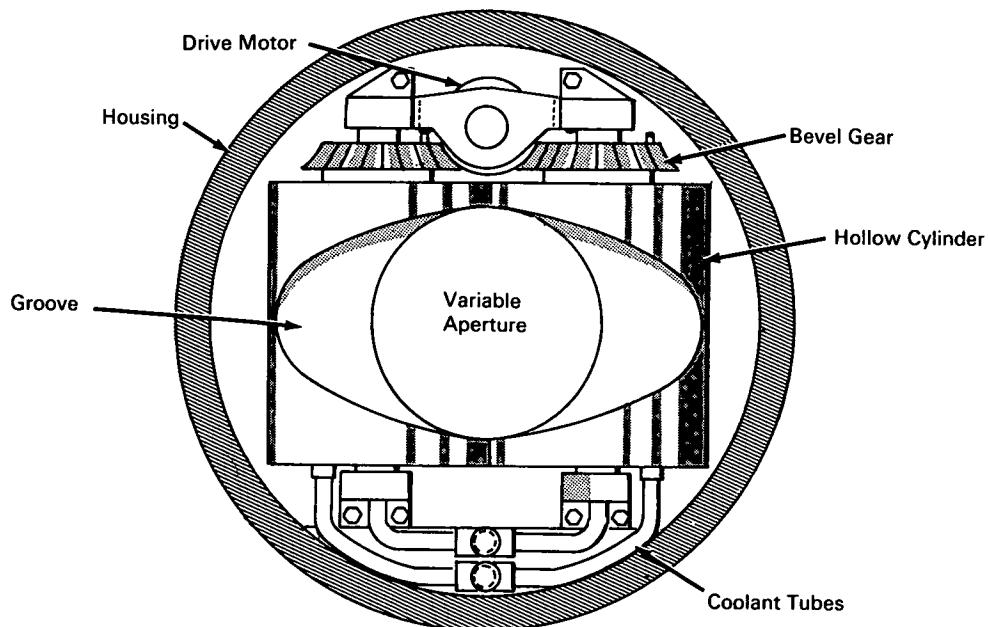


NASA TECH BRIEF



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Light-Intensity Modulator Withstands High Heat Fluxes



The problem:

To design a mechanism that will modulate and control the intensity of luminous radiation in light beams, such as from carbon arcs, high-pressure xenon bulbs, and plasma arcs, associated with high-intensity heat flux. Conventional devices, such as iris diaphragms, aperture plates, and optical filters, are not adaptable to continuous operation under extreme heating conditions.

The solution:

A light-intensity modulator incorporating two fluid-cooled, externally grooved, contacting metal cylinders

which when rotated about their longitudinal axes present a circular aperture of varying size depending on the degree of rotation.

How it's done:

The contact surface of each cylinder is grooved or depressed in such a manner that the projection of the two cylinders as viewed in a direction perpendicular to the plane containing the two parallel axes presents a circular aperture, which can be made to vary in diameter by rotating the cylinders. Consequently, when the cylinders are symmetrically positioned in the path of a light beam with their axes

(continued overleaf)

perpendicular to the beam, the diameter of the transmitted beam will correspond to the diameter of the aperture. The cylinders are hollow and are provided with fittings for internal circulation of a cooling fluid. Although various types of drive may be used to rotate the cylinders, the rotation may be made responsive to a conventional servo motor and a light-intensity sensor for controlling the modulation of the radiation beam.

Notes:

1. The aperture can be made in other shapes for special applications by forming the cylinder grooves in appropriate configurations.

2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Manned Spacecraft Center
Houston, Texas 77058
Reference: B66-10532

Patent status:

This invention is owned by NASA, and a patent application has been filed. Royalty-free, nonexclusive licenses for its commercial use will be granted by NASA. Inquiries concerning license rights should be made to NASA, Code GP, Washington, D.C. 20546.

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(MSC-246)